In the Claims:

Please amend the claims as indicated in the separate sheets attached below and entitled "Claim Amendments Filed 05/16/2006 with Response to Office Action mailed by Examiner on 11/16/2005 in Patent Application No. 10/714,524".

REMARKS

Claims 1-121 were previously pending in this application. Claims 15, 48, 83 and 96 are amended to correct typographical errors and/or obvious mistakes that would be apparent to those of ordinary skill in the art in the context of the surrounding language of the claim. Accordingly, since the apparent errors have simply been corrected to reflect the way in which the claim with the error would have been interpreted by those of ordinary skill in the art, the amendment is clerical in nature and non-narrowing. No new matter has been added.

Claims 75 and 93 have been amended to clarify that the recited plurality of reflectors include two reflectors that reflect substantially all of the energy impinging thereon. As discussed below, because these claims require two reflectors reflecting substantially all of the energy impinging thereon, they are not anticipated or rendered obvious by any of the cited art.

Claims 106, 109, and 114 have been amended to clarify that those claims are directed to Raman lasers or amplifiers. As discussed below, the reference cited against these claims does not teach or suggest a Raman laser or amplifier and thus does not anticipate or render obvious these claims.

Support for the foregoing amendments is clearly found throughout the specification, including the Figures and the claims. No new matter is added.

Rejection of Claims 1-6, 9, 13-18, 40-52, 75, 76, 80, 93-115, 119, 120, and 121 under 35 U.S.C. 102(b) over U.S. Patent No. 6,018,534

Claims 1-6, 9, 13-18, 40-52, 75, 76, 80, 93-115, 119, 120, and 121 have been rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,018,534

("Pan"). The Office Action alleges that Pan discloses all of the elements of these claims because Pan teaches a laser with three reflectors. The Office Action also states that the claimed characteristics of the Raman Stokes shift and power of the energy are inherent in the Pan device.

Regarding independent claims 1, 75 (as amended above), and 93 (as amended above), Pan fails to disclose a common limitation to all three of these claims, and thus does not anticipate or suggest the claimed subject matter. Specifically, Pan is directed to a fiber Bragg grating DFB-DBR laser comprising two reflectors. Each of independent claims 1, 75, and 93 against which Pan is cited require two reflectors that each "reflect substantially all energy impinging thereon," while, by contrast, at least one of the two reflectors disclosed in Pan does not and cannot reflect substantially all energy as explained in the specification of that patent. FIG. 1 from Pan illustrates an embodiment of the disclosed invention. The device taught by Pan is a conventional, non-Raman optical fiber laser. The two reflectors FIG. 1, 11 and 12, could not both reflect substantially all energy consistent with the disclosed invention. If the first reflector 11 and the second reflector 12 both reflected substantially all energy, there would be insufficient energy exiting the laser at the output end and the device would not function for its intended purpose.

Pan explains that only one of the reflectors has a high reflectivity at Col. 3 Lines 2-5: "The fiber Bragg grating 11 has a high reflectivity and the other fiber Bragg grating 12 has a reflectivity determined for optimum output coupling to control the output of the resulting fiber laser for different applications." Thus, reflector 12 is specifically intended to allow a substantial amount of energy to leave the resonating cavity, rather than to reflect substantially all energy within the resonating cavity. Pan further explains at Col. 5 Lines 13-16: "The reflectivity of the fiber Bragg grating 12 is monitored during construction to maximize the output power of the fiber interactive DFB-DBR laser." Again, the second reflector in Pan maximizes output power, and accordingly could not possibly reflect "substantially all energy impinging thereon" as recited in the independent claims 1, 75, and 93.

Independent claim 46 similarly requires that the first and second reflector both be "substantially totally reflective," and for essentially the same reasons as discussed above

is not anticipated or rendered obvious by Pan, in which the second reflector maximizes output power as shown above.

It is also clear that the third Bragg grating 13 disclosed in Pan also does not and cannot reflect "substantially all energy impinging thereon." This is made clear by an example provided by Pan at Col. 6 Lines 23-26: "The DFB fiber Bragg grating 13 has a reflectivity of 18 dB and the high reflectivity fiber Bragg grating 11 has a reflectivity of 24 dB and a length of 18mm." Thus, in this example, the third Bragg grating 13 has a reflectivity 6 dB less than the "high reflectivity" Bragg grating 11, i.e., at least several times less reflectivity, as the dB measurement of reflectivity is on a logarithmic scale. Accordingly, assuming *arguendo* that Pan even teaches a reflector reflecting "substantially all energy impinging thereon", Pan teaches at most <u>one</u> such Bragg grating reflecting "substantially all energy impinging thereon," and does not therefore anticipate or suggest all of the limitations of independent claims 1, 46, 75, and 93 against which it is cited.

Because each of the limitations of independent claims 1, 46, 75, and 93 have not been shown by the Patent Office to have been taught or suggested in Pan, it is believed that these claims are patentable over Pan for at least this reason. While the Applicants do not concede that Pan teaches the further limitations added by claims 2-6, 9, 13-18, 40-45, 47-52, 76, 80, and 94-95, Applicants note that these claims depend from one of claims 1, 46, 75, or 93 and, thus, are patentable over Pan for at least the reasons discussed above with regard to claims 1, 46, 75, and 93.

Regarding independent claim 96, Pan does not teach the requirement that the energy propagating at the first wavelength undergo at least one Raman Stokes shift to create energy at the second wavelength. The device disclosed in Pan is a conventional, non-Raman fiber laser. Pan does not disclose or discuss a Raman laser or Stokes shifts. It would be apparent to one of ordinary skill in the art that the resonating chamber disclosed in Pan, for example the chamber depicted in Fig. 1 and described in Col. 2 Lines 63-67, is a conventional, non-Raman system.

The Patent Office has stated that the claimed characteristics of the Raman Stokes shift and the power of the energy is inherently shown by the Pan device. Applicants respectfully disagree. To begin with, Applicants point out that the burden is on the Patent

Office to establish the inherency in the prior art of each and every one of the claim limitations.[1] The Office Action fails to meet this burden by failing to provide any reasonable rational or technical reasoning to support the proposition that the Raman Stokes shift limitation in the rejected claim would necessarily flow from the device taught by Pan. The Patent Office has not, in the present rejection, established anything close to an adequate basis in fact and/or technical reasoning to reasonably support the assertion that the Raman Stokes shift limitation recited in Applicants' rejected claim 96 is inherently anticipated by Pan, as required under the law (see MPEP §2112).

Accordingly, Pan does not disclose or suggest the limitation of claim 96 of a Raman Stokes shift.

Because each of the limitations of independent claim 96 has not been shown by the Patent Office to have been taught or suggested in Pan, it is believed that this claim is patentable over Pan for at least this reason. While the Applicants do not concede that Pan teaches the further limitations added by claims 97-105, Applicants note that these claims depend from claim 96 and, thus, are patentable over Pan for at least the reasons discussed above with regard to claim 96.

Similarly, regarding independent claims 106, 109, and 114, Pan does not teach or suggest a Raman laser or amplifier. Instead, Pan teaches an improved conventional, non-Raman laser. Thus, these claims are similarly patentable over Pan. While the Applicants do not concede that Pan teaches the further limitations of dependent claims 107-108, 110-113, 115, 119, 120-121, Applicants note that these claims depend from one of claims 106, 109, or 114, and, thus, are patentable over Pan for at least the reasons discussed above with regard to those claims.

Accordingly, withdrawal of the rejection of all of the claims presently rejected on this basis is respectfully requested.

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[1] To meet this burden, the Examiner must provide a rationale or evidence tending to shown inherency. The fact that a certain characteristic may be present in the prior art is not sufficient to establish the inherency of that result or characteristic (see MPEP §2112). The limitation must necessarily be present in the teachings of the reference, such that it would be recognized as such by persons of ordinary skill in the art (MPEP §2112 and §2131.01). Inherency may not be established by mere probabilities or possibilities (MPEP §2112). "In relying upon a theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art" (MPEP §2112 quoting Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Int. 1990) (emphasis in original quotation)).

Rejection of Claims 1, 2, 4-6, 9, 13-36, 40-49, 51-55, 61, 66-80, 82-97, and 99-105 Under 35 U.S.C. 102(b) over U.S. Patent No. 6,181,465

Claims 1, 2, 4-6, 9, 13-36, 40-49, 51-55, 61, 66-80, 82-97, and 99-105 have been rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,181,465 ("Grubb").

Regarding independent claims 1, 46, 53, 70, 75, and 93, each of these claims requires reflectors that "reflect substantially all energy impinging thereon" (Claims 1, 53, 70, 75, and 93) or that the two reflectors be "substantially totally reflective" (Claim 46) – two such reflectors for claims 1 and 46, as discussed above, four such reflectors for claims 53 and 70, and a "plurality of reflectors" for claims 75 and 93. Similar to Pan, Grubb does not disclose a device in which at least two reflectors reflect "substantially all energy impinging thereon" or are "substantially totally reflective." In fact, the gratings disclosed in Grubb are configured to serve a very different function than the reflectors in the invention as recited in claims 1, 46, 53, 70, 75, and 93. The Grubb gratings are in fact constructed to divert energy into the cladding, rather than to reflect energy within the fiber as do the reflectors recited in claims 1, 46, 53, 70, 75, and 93. The gratings in Grubb are "long period gratings," as explained at Col. 6 Lines 31-34. Grubb states at Col. 6 Lines 34-36: "The grating 302 is fabricated using conventional techniques with a periodicity selected to provide a relatively high insertion loss at the Raman frequency while simultaneously providing a low insertion loss at the lasing frequency." It is well known in the art that a "long period grating" is a grating that loses energy, rather than one that reflects energy as in the claimed invention. This is confirmed in the immediately following language in the Grubb specification at Col. 6 Lines 38-43: "The long period grating 302 acts as a discrete loss element to Raman wavelength signals propagating in the optical fiber. The grating 302 is generally tens to hundreds of times the lasing wavelength and causes the Raman-shifted wavelength to be directed out into the outer cladding." Thus, the grating 302 in Grubb does not reflect "substantially all energy" as in the claimed invention, but instead is configured to direct energy "into the outer cladding." Accordingly, Grub fails to teach a common limitation of independent claims 1, 46, 53, 70, 75, and 93 against which it is cited.

Because each of the limitations of independent claims 1, 46, 53, 70, 75, and 93 have not been shown by the Patent Office to have been taught or suggested in Grubb, it is believed that these claims are patentable over Grubb for at least this reason. While the Applicants do not concede that Grubb teaches the further limitations added by claims 2, 4-6, 9, 13-36, 40-45, 47-49, 51-52, 54-55, 61, 66-74, 76-80, 82-92, or 94-95, Applicants note that these claims depend from one of claims 1, 46, 53, 70, 75, or 93 and, thus, are patentable over Grubb for at least the reasons discussed above with regard to claims 1, 46, 53, 70, 75, and 93.

Regarding independent claim 96, this claim requires the energy propagating in the optical fiber at the first wavelength to undergo "at least one Raman Stokes shift to create energy in the optical fiber at the second wavelength." Further, the "power output by the optical fiber at the second wavelength is at least about 55% of a power of the energy that optical fiber receives at that first wavelength." Thus, independent claim 96 requires a power output at least 55% of the energy at the second (Stokes-shifted) wavelength. Grubb does not teach or suggest this limitation. The grating 302 in Grubb is designed to cause the Raman-shifted wavelength to be directed out into the outer cladding and thus not to the output.

Because independent claim 96 has not been shown by the Patent Office to have been taught or suggested in Grubb, it is believed that this claim is patentable over Grubb for at least this reason. While the Applicants do not concede that Grubb teaches the further limitations added by claims 97 and 99-105, Applicants note that these claims depend from claim 96 and, thus, are patentable over Grubb for at least the reasons discussed above with regard to claim 96.

Accordingly, withdrawal of the rejection of all of the claims presently rejected on this basis is respectfully requested.

Rejection of Claims 7, 8, and 10-12 Under 35 U.S.C. 103(a) over Pan

The Patent Office has rejected claims 7, 8, and 10-12 as obvious in light of Pan. As explained above, Pan fails to teach more than one reflector that reflects substantially all energy, nor does it suggest any such design and thus does not anticipate or render obvious independent claim 1 from which all of these claims depend. Without conceding

the merits of the additional bases raised in the Office Action for rejecting these claims, Applicants note that since these claims include all of the limitations of claim 1 they are similarly patentable over Pan. Thus, claims 7, 8, and 10-12 are not obvious in view of Pan.

Rejection of Claims 7, 8, 10-12, 37-39, 56-60, and 62-65 Under 35 U.S.C. 103(a) over Grubb

The Patent Office has rejected claims 7, 8, 10-12, 37-39, 56-60 and 62-65 as obvious in light of Grubb. As explained above, Grubb fails to teach more than one reflector that reflects substantially all energy, nor does it suggest any such design and thus does not anticipate or render obvious independent claims 1 and 53 from one of which all of these claims depend. Without conceding the merits of the additional bases raised in the Office Action for rejecting these claims, Applicants note that since these claims include all of the limitations of either claim 1 or claim 53 from which they depend, they are similarly patentable over Grubb. Thus, claims 7, 8, 10-12, 37-39, 56-60 and 62-65 are not obvious in view of Grubb.

Request for Three Month Extension of Time

Applicants hereby request an extension of time of three months for response to the outstanding Office Action mailed November 16, 2005, thereby extending the time for response to May 16, 2006.

Electronic Payment of Fees

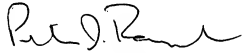
Fees associated with this filing (Three Month Extension of Time fee of $510 for a Small Entity) are being paid electronically. No other fees are considered to be due. However, if it is determined that an additional fee is due, or that an overpayment has been made, please debit or credit, as appropriate, Deposit Order Account 50-2343.

CONCLUSION

This Response and Amendment addresses all matters raised by the Examiner in the outstanding Office Action. No fee other than the fee associated with the Request for a Three Month Extension of Time is considered to be due in conjunction with the submission of this Response and Amendment. However, if it is determined that an additional fee is due or that Applicants are underpaying or overpaying a fee, further authorization is hereby granted to debit or credit, as appropriate, Nufern Deposit Order Account 50-2343.

Please do not hesitate to contact the undersigned if any issues are deemed to remain unresolved.

Respectfully submitted,



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